REMARKS/ARGUMENTS

This paper is submitted responsive to the official action mailed January 5, 2004. Reconsideration of the application in light of the accompanying remarks and amendments is respectfully requested.

Initially, the undersigned would like to thank Examiners Ridley and Johnson for courtesies extended during a telephone interview held April 8, 2004 wherein the outstanding art rejection was discussed at length. Although agreement was not reached at that time, the undersigned was greatly assisted in understanding the prior art and application of same, and this response is based thereon.

In the aforesaid action, the examiner has objected to the abbreviation "pph" in the specification. An amendment has been made to the specification to recite that pph stands for pounds per hour. This is not new matter and the examiner agreed during the aforesaid interview to enter this amendment.

In the aforesaid Office action, the examiner has allowed claim 6 and has rejected all other claims as anticipated or obvious based upon prior art. Claims 1-2, 5 and 11 have been rejected as anticipated by U.S. Patent No. 4,473,622 to Chaludzinski et al. (Chludzinski); claims 3-4 and 7-8 have been rejected under 35 U.S.C. 103(a) as unpatentable over Chludzinski in view of either U.S. Patent No. 4,042,016 to Boochever et al. (Boochever)or U.S. Patent No. 3,651,641 to Ginter (Ginter); Claims 9 and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chludzinski in view of U.S. Patent No. 4,530,886 to Sederquist; (Sederquist) and independent claim 17 was rejected under 35 U.S.C. 103(a) as

unpatentable over Chludzinski in view of U.S. Patent No. 3,982,962 to Bloomfield (Bloomfield).

Reconsideration of the art rejection is respectfully requested.

Chludzinski does not contain any teaching or suggestion which would lead one of ordinary skill in the art to make the modification suggested by the examiner in meeting the subject matter of the dependant claims which had been rejected under 35 U.S.C 103(a). On that point agreement was not reached during the interview. In addition, and as explained in the interview, applicant respectfully urges the examiner to reconsider the rejection of claim 1 as well.

Claim 1 is drawn to a fuel cell system and requires, among other elements, a water feed means for feeding water from the water source to at least one of the first and second conduit means in a controlled manner for cooling at least one of the reformed gas and gas stream, respectively, to a desired temperature. This claim element is set forth in means plus function format and is properly interpreted following the requirements of 35 U.S.C. 112 6th paragraph. Thus, this limitation is properly interpreted as covering the structure disclosed in the specification for performing the claimed function, and structures which are equivalent thereto.

The structure disclosed in the specification for feeding water from the water source to the conduit means in a controlled manner for cooling to a desired temperature includes a water feed line 42 to a particular conduit 18, 22, and the feeding in a controlled manner is carried out through temperature sensor 44 and valve 46 which is controlled in accordance with readings from sensor 44. Cooling is carried out by mixing liquid water with the stream. This liquid water is indicated in the specification as the vehicle for

cooling, as the appreciable and important portion of the cooling is done through evaporation of the liquid water.

In meeting this structure, the examiner pointed to Chludzinski and the water vapor transporting membrane positioned between two different lines of the system. This membrane is said to pass water vapor from the anode exhaust to the higher temperature reformate stream thereby drying the hydrogen and partially humidifying the reformate.

Thus, the disclosure of Chludzinski is a membrane which transports water in vapor state from one line to another. No mechanism is disclosed for making this transport in a controlled manner. It is respectfully submitted that this disclosure is clearly not within the scope of the limitation of claim 1. Specifically, claim 1 when properly interpreted under 35 U.S.C. 112, 6th paragraph is not met by a water vapor transport membrane. Chludzinski may inherently cool the higher temperature stream, but in a different and non-equivalent manner to that set forth in the specification. Further, nothing in Chludzinski discloses or suggests controlling the amount of water based upon temperature of the stream into which the water is being added.

Based upon the foregoing, Chludzinski clearly fails to meet each and every limitation of independent claim 1, and therefore does not anticipate same. Reconsideration of the rejection holding anticipation is therefore respectfully requested.

In connection with dependant claims calling for additional structure related to the water cooling means, the examiner has cited various different secondary prior art patents. These patents will be discussed below in the order they are mentioned in the office action.

In connection with claims 3-4 and 7-8, the examiner has relied upon Boochever or Ginter as secondary references. Claims 3 and 4 are drawn to further detail of the water feed means, specifically wherein the water feed means includes control means for controlling the feeding of water to at least one of the first and second conduits, and further wherein the control means senses the temperature of the reformed gas and gas stream, respectively, and feeds water to at least one of the first and second conduits, respectively, in response to sensed temperature.

The examiner states that Chludzinski teaches that it is known in the art to condense water out of the fuel cell effluent and to add said water into another process stream. The examiner points to column 7, lines 9-32. It is respectfully submitted that this portion of Chludzinski in fact teaches that the water vapor transfer device of Chludzinski is superior to other methods involving condensation of water out of a stream, since the water vapor transfer devices advantageously transport water vapor without the need for condensing, separating and revaporization of the water. Thus, the portion cited by the examiner is viewed as fairly teaching away from any modification of the Chludzinski reference which approaches that of the present application.

The examiner has taken official notice that it is known to control temperature of gas feed stream for the shift reactor and the fuel cell for the purpose of optimizing performance. No prior art document provided by the examiner contains any support for this official notice, and support for taking of this official notice is respectfully requested.

In connection with specific claim language drawn to the feed of water, claim 8 sets forth the additional structure of means to

atomize water. The examiner asserts that such atomizing is known in the art and points to the Boochever and the Ginter references.

In connection with the Boochever reference, Boochever is drawn to an environmental humidification and cooling system which includes an ultrasonic spray nozzle. Humidification in this system is effected by spring atomized water with the ultrasonic nozzle into the suction chamber of a fan. The examiner has asserted that there is sufficient connection between Boochever and Chludzinski to make a combination to result in the subject matter of claim 8 based upon the fact that the water vapor transfer devices in Chludzinski are "humidifiers", and that humidification is the goal in Boochever. While humidification is indeed a common thread, the humidification being accomplished is substantially and drastically different. Aside from the fact that both include the physical reaction of humidification, it is respectfully submitted that these processes have absolutely nothing in common which would lead a person of skill in the art to which the invention pertains, that is, fuel cell systems, to consult the Boochever reference drawn to an environmental humidification and cooling system (i.e. an air conditioning and dehumidification system).

It is further submitted that even should a person of ordinary skill in the art consider Boochever, the combination would not be made in light of the teaching in Chludzinski that the water vapor transfer device which would be replaced by the structure from Boochever is said to be an advantage and an improvement over structures such as that disclosed in Boochever which would require condensing, separating and revaporization of the water.

Turning to Ginter, Ginter is drawn to an engine system and thermo-generator therefore. Ginter is drawn to a combustion engine

and uses a water line to supply atomized water to the combustion chamber. As with the Boochever reference, it is respectfully submitted that a person of ordinary skill in the art to which the invention pertains, that is, fuel cell systems, would clearly not consult prior art drawn to a combustion engine for any structure which could conceivably be viewed as an alternative to the water vapor transfer devices of Chludzinski. This is clear hind sight reconstruction of the claims of the present application, and is not a proper basis for a supportable prior art rejection.

In connection with claims 9 and 10 these claims depend directly or indirectly from independent claim 1 and are submitted to contain patentable subject matter based upon this dependency. The Sederquist patent cited in this rejection, while disclosing high-surface area material, does not add anything to the rejection to cure the deficiency of the anticipation rejection which has been entered in connection with claim 1.

In connection with independent claim 17, this claim is submitted to contain patentable subject matter based upon the same argumentation as set forth above in connection with claim 1. The rejection of claim 17 has been made under 35 U.S.C. 103, and Bloomfield used to teach use of a selective oxidizer as set forth in independent claim 17. It is respectively submitted that Bloomfield likewise does not cure the deficiency as between the water vapor transfer devices of the Cludzinski primary reference and the element of claim 1 as discussed above.

Based upon the foregoing, it is respectfully submitted that all claims of the present application define patentably over the art of record. Early and favorable action is therefore respectfully solicited.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is believed that no additional fee is due in connection with this response. If, however, any fee is due, please charge same to deposit account no.: 02-0184.

Respectfully submitted,

By _____

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on April 12, 2004.

Natalie M. Pimentel